

# *Civil and Environmental Engineering, PhD (Boston)*

The Doctor of Philosophy in Civil and Environmental Engineering offers students an opportunity for in-depth study in a broad range of areas in civil and environmental engineering. Awarding the PhD degree is based on ability to formulate and execute original research addressing important problems and completion of a rigorous academic program that enhances the student's knowledge in relevant areas. The PhD program has two components:

1. An academic program of graduate-level courses that provides depth in a specific area of civil and environmental engineering (the major field) as well as other coursework that provides additional exposure at an advanced level to one or more disciplines
2. The dissertation, an extended independent research effort on a relevant technical problem resulting in an original contribution to the field

Upon acceptance into the program, an applicant is designated as a doctoral student. This designation is changed to doctoral candidate upon successful completion of the doctoral qualifying examinations (both written and oral area exams) and all the required coursework.

Each student's mastery of subject matter is measured by a qualifying examination covering a subset of topics selected from the major field. A doctoral dissertation committee periodically monitors research progress, and the candidate is required to present and defend their research results before the doctoral dissertation committee upon completion of the work.

## **Coursework Requirement**

The academic program must include at least 22 semester hours (advanced standing) or 50 semester hours (direct entry) of graduate-level coursework at Northeastern University. A student may count no more than 4 semester hours of independent study (such as special project in civil and environmental engineering) toward the minimum course requirements. For direct entry students, a minimum of 40 semester hours must be related to the major field but may include courses from other departments when appropriate. The civil and environmental engineering department encourages flexibility in program definition, especially in areas where complementary courses exist in other departments or where expertise resides outside the department and the objective is to introduce new technology in civil and environmental engineering practice.

PhD students who have completed the majority of their coursework and not yet reached PhD candidacy should register for Exam Preparation—Doctoral (CIVE 8960), in a section for which their research or academic advisor is listed as the instructor in the online registration system.

Upon successful completion of the qualifying exam and the majority of required coursework, each doctoral candidate must register in two consecutive semesters for Dissertation Term 1 (CIVE 9990) and Dissertation Term 2 (CIVE 9991). Upon completion of this sequence, the candidate must register for Dissertation Continuation (CIVE 9996) in every semester until the dissertation is complete. Students may not register for Continuation until they fulfill the two-semester dissertation sequence.

## **Qualifying Examination and Degree Candidacy**

The objective of the doctoral qualifying examination is to determine whether the applicant possesses mastery of the fundamentals and ability to apply them to solve unfamiliar problems that require analysis, synthesis, and independent thinking, as well as communication skills to present research ideas and plans, motivate problems, respond to related questions, and defend assumptions and technical approach.

The qualifying exam includes written and oral components. Its content depends upon the educational background and objectives of the student. In general, the written component covers four subject areas selected from the major field and includes engineering and science disciplines, as well as civil and environmental engineering application areas. The oral component measures general comprehension and aptitude for research. If a student fails the exam, they may retake it one more time with the permission of the qualifying examination committee.

The qualifying exam is administered within the first 18 months of the PhD program, if the student already holds an MS degree. PhD students who begin the PhD program without an MS degree should take the qualifying exam within the first 30 months of the start of the program.

Under extraordinary circumstances, a student may be granted one additional semester before taking the qualifying exam but only by prior petition to the advisor, concentration representative, and graduate studies committee.

## **DISSERTATION**

Once degree candidacy is established, a doctoral candidate may proceed with their dissertation. The candidate must write a dissertation proposal and name a CEE faculty member as the dissertation advisor. The candidate and the advisor must form a dissertation committee, which should have no fewer than four members, of which at least two are full-time (or affiliated) faculty from the CEE department. The committee will monitor progress and approve the final document.

## **DISSERTATION PROPOSAL PRESENTATION**

Each student, along with a faculty advisor, must jointly develop a proposal defining the content of the academic program, subject to review by the dissertation committee. Intellectual rigor, connectivity of subject matter, and compatibility with departmental interests are critical issues. The doctoral dissertation committee's approval of the proposal represents a mutual agreement between the student and the committee.

## **Comprehensive Examination**

The comprehensive exam is a defense of the doctoral research work and an examination on subject matter related to the dissertation area.

Each doctoral candidate must defend their dissertation within seven years from the start of the PhD program.

## Annual Report

At the beginning of each calendar year all CEE doctoral students, including interdisciplinary students within CEE, should complete the Annual PhD Student Progress Report, which details academic and research activities and accomplishments over the previous year. These forms will be reviewed by the faculty in each respective concentration to ensure satisfactory progress, with feedback provided to the students as necessary.

## Residence Requirement

After achieving PhD candidacy, students must complete at least two successive semesters of full-time study on campus to establish residence. The total effort for a PhD program involves a minimum of three years of full-time work beyond the bachelor's degree. Students who enter the doctoral program with a Master of Science degree may complete the requirements in less time but should anticipate at least two years of full-time effort.

## Language Requirement

Each doctoral candidate must be proficient in technical writing and oral presentation in the English language. The qualifying examination committee may require additional coursework in the case of any deficiency in these areas.

## Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

### Milestones

Qualifying examination and comprehensive examination  
Annual review  
Dissertation proposal  
Dissertation committee  
Dissertation defense

## Core Requirements

Complete at least 50 semester hours of approved coursework. Consult your faculty advisor for acceptable courses. Please note that a maximum of 4 semester hours of Directed Study (CIVE 7976) will be accepted toward the 50-semester-hour requirement.

| Code      | Title                                                    | Hours |
|-----------|----------------------------------------------------------|-------|
| CIVE 7001 | Research Methods For Civil and Environmental Engineering | 2     |

## Dissertation

| Code      | Title               | Hours |
|-----------|---------------------|-------|
| CIVE 9990 | Dissertation Term 1 |       |
| CIVE 9991 | Dissertation Term 2 |       |

## Program Credit/GPA Requirements

50 total semester hours required  
Minimum 3.000 GPA required

## Advanced Entry Program Requirements

### Coursework Requirement

The Department of Civil and Environmental Engineering encourages flexibility in program definition, especially in areas where complementary courses exist in other departments or where expertise resides outside the department and the objective is to introduce new technology in civil and environmental engineering practice. The academic program must include at least 22 semester hours of graduate-level coursework at Northeastern University. A student may count no more than 4 semester hours of directed study toward the minimum course requirements.

Complete all courses and requirements listed below unless otherwise indicated.

### Milestones

Qualifying examination and comprehensive examination  
Annual review  
Dissertation proposal  
Dissertation committee  
Dissertation defense

## Core Requirements

Complete 22 semester hours of approved coursework. Consult your faculty advisor for acceptable courses. Please note that a maximum of 4 semester hours of Directed Study (CIVE 7976) will be accepted toward the 22-semester-hour requirement.

| Code      | Title                                                    | Hours |
|-----------|----------------------------------------------------------|-------|
| CIVE 7001 | Research Methods For Civil and Environmental Engineering | 2     |

## Dissertation

| Code      | Title               | Hours |
|-----------|---------------------|-------|
| CIVE 9990 | Dissertation Term 1 |       |
| CIVE 9991 | Dissertation Term 2 |       |

## Coursework Requirement

The academic program must include at least 22 semester hours of graduate-level coursework at Northeastern University.

A student may count no more than 4 semester hours of directed study toward the minimum course requirements.

## Program Credit/GPA Requirements

22 total semester hours required

Minimum 3.000 GPA required